were modest, but enthusiasm was great, and the outcome has been of the widest interest. One of the early fruits from this new observatory was the spectrum catalogue of 4051 stars, important, not only because it illustrated the manner in which large masses of work could be dealt with in the new institution, but for the extensive application of the method of classifying stellar spectra to which the name of Vogel is particularly attached. He early appreciated the probability that the phase of development of a particular star was in general mirrored in its spectrum, and that any rational classification of the stars could only be obtained by giving prominence to that central fact.

Another class of work which largely occupied Prof. Vogel's attention was his investigation by means of photography of the motions in the line of sight of all the brighter stars visible in Potsdam. If he was not the first to apply photography in this particular direction, he was certainly among the most successful. This success was due in a great measure to the fact that he recognised, more fully than was generally the case thirty years ago, the necessity of constructing an instrument to a definite end, of making it exclusively available for one particular object. The possession of the most suitable apparatus not only gave improved and consistent values for the motion of stars in the line of sight, but satisfactorily explained the cause of the variability of Algol and stars of that type. His determination of the elements of that spectroscopic binary is typical of an immense amount of work which Vogel effected in the case of many other binaries. In observing variable and temporary stars his energy found another large field for its display, but it is impossible to enter into details. His was a busy life with many interests, and he assisted science in various directions.

Although aided by able and zealous colleagues, he was responsible as director of the observatory for the conduct of several large pieces of work. It will be sufficient to refer here to his participation in the work of the International Chart of the Heavens, to which in its early days he devoted much attention. The rigorous determination of the magnitude of all the brighter stars in the *Bonn Durchmusterung* by means of the Zöllner photometer is another piece of heavy observation which he brought to a successful issue. Simultaneously with the steady progress of these and other inquiries has gone the remodelling of the observatory, and the substitution of larger and more powerful instruments for those which tended to grow obsolete. The mounting of the 80-centimetre refractor offers a proof of the care and foresight which he devoted to this part of his duties.

We believe that when the effect of Vogel's work is considered and judged, his capacity as a director must be fully and generously recognised. As guardian of a new institution for which there were no traditions to guide the future development, as a conductor of an untried experiment, uncertain in what direction progress might be anticipated, he has maintained the observatory at a uniformly high level, and produced a quantity of work of the most accurate character. This has been shown to some extent by his election into many learned societies, the members of which have appreciated his work and acknowledged his influence. He has left an example to be followed, and a reputation to be honoured. To his colleagues, some of whom have served with him many years, and who have suffered the loss of his experience and his kindly assistance, we offer our respectful sympathies.

W. E. P.

## NOTES.

IT is announced in the *Electrician* that the "John Scott Legacy Medal and Premium" of the Franklin Institute has been awarded to Prof. J. A. Ewing, F.R.S., and Mr. L. H. Walter for their method of detecting electrical oscillations.

THE programme of proceedings of the forthcoming meeting (on September 23 and 24) of the Iron and Steel Institute in Vienna has now been issued; from it we learn that the following papers may be expected to be submitted:—on the development of the iron industry of Austria since 1882, by W. Kestranek; on the Styrian Erzberg iron-ore mines, by Prof. H. Bauerman; on steel and meteoric iron, by Prof. F. Berwerth; on the determination of the quantity of blast-furnace gas for a given make of pig iron, by Prof. Josef von Ehrenwerth; on the application of the laws of physical chemistry to the metallurgy of iron, by Baron H. von Jüptner; on case hardening of mild steel, by C. O. Bannister and J. W. Lambert; on a new blue-black paint as a protective covering for iron, by F. J. R. Carulla; on the hardening of steel, by L. Demozay; on the structure of hardened steel, by Percy Longmuir; on case hardening, by G. Shaw Scott; on the ageing of mild steel: further notes, by C. E. Stromeyer; and on the economical distribution of electric power from blast furnaces, by B. H. Thwaite.

PRINCE HENRY ZU SCHÖNAICH-CAROLATH has consented to act as president of the fourteenth International Congress for Hygiene and Demography, which is to take place in Berlin next month, and Dr. Rubner, Privy Councillor of Medicine and professor of hygiene at the Royal University of Berlin, and Prof. von Mayr, Under-Secretary of State, Munich, will be vice-presidents.

THE eleventh congress of Flemish naturalists will be held from September 21 to 23 at Malines under the presidency of Prof. C. de Bruyn, professor of botany and zoology in the University of Ghent. The secretary of the congress is Dr. de Bruycker, place du Grand-Canon, Ghent.

AN International Exhibition is to be held in Tokio from April 1 to October 15 of next year. The estimated cost is 2,000,000*l.*, towards which the Japanese Government has set aside 1,000,000*l.*

ACCORDING to a telegram in the *Times*, two sharp shocks of earthquake occurred at 4.32 of the afternoon of August 22 at Kingston, Jamaica.

PARTICULARS of the preparations in progress for the Wellman Polar Expedition are given in a Reuter message dated from Spitsbergen, July 25, from which we learn it was expected that the expedition would be ready to start for the far north by the middle of August. One of the many difficult pieces of work which had to be accomplished was the packing and making ready for the *America* of the two "serpents" which form an important part of the project. One of the serpents—a pipe of strong, water-tight leather, 6 inches in diameter and 123 feet long, its outside surface covered with more than 29,000 steel scales, each about as big as a silver quarter, very thin, and riveted to the leather, overlapping like the scales of a fish—has been designed to have the smallest possible resistance in sliding over the ice or snow, or floating on the water, in which element it is buoyant. The retarder serpent, on the other hand, is designed to make the greatest possible resistance in proportion to its weight in dragging over the ice-floes, which are usually covered with a snow-crust and rarely present a smooth surface. The function of the retarder is to drag like a drag-anchor when the wind is adverse to the course and it is wished to drift gently with it, and without losing either too much headway or burning too much fuel in the motor. Hence this serpent is covered with 1875 steel scratchers, each with six sharp points about 1 inch in length, or a total of 11,250 points on the 75 feet of body. The equilibrer is intended always to have more or less of its length upon the surface of the earth; the retarder is to be let down to touch the earth only when necessary. Reserve supplies of food to the amount of 1438 lb. have been packed in the interior of the serpents.

THE Prince of Monaco has arrived at Tromsö on board the *Princess Alice*, having left the *Hjalmar*, the vessel conveying the Johansen expedition, at Kved Fjord about the middle of August. The *Hjalmar* left for Prince Charles Foreland, where it is the intention of Johansen to meet the Bruce expedition, and which will probably be the winter quarters of the explorers.

MR. W. F. DENNING writes to say that a rather fine meteor, presumably from the Draconid radiant, to which he referred in a letter in our last number, was seen at Bristol on August 20, 9h. 18m. The curious feature about the object was its fluctuation in brilliancy. At first nearly equal to Jupiter, it quickly dropped to about two magnitudes, and finally burst out with a lustre rivalling that of Sirius. Its path was from about 231°+57° to 213°+50°. As viewed from Wales, the meteor must have been very conspicuous and striking, and Mr. Denning will be glad of any descriptions of it.

THE secretary of the Kite Committee of the Royal Meteorological Society has written to the Press to say that, of the twenty-four meteorographs sent up in July last in connection with the international investigations of the upper air, only a few have been returned. He thinks it possible that some may have fallen among the standing corn and other crops, and so have not yet been seen. The secretary requests that a sharp look-out may be kept for the cylinders containing the meteorographs, and that if any be found they may be carefully handled and returned to the address given on the label or to himself at the Royal Meteorological Society. The next special series of ascents will take place from September 4 to 6 next.

WITH a view to supplying Paris with electric energy for its railways and lighting, three Paris engineers have drawn up a project for establishing an immense power station by barring the Rhône Valley, at Gresin, near Bellegarde. The enterprise has, says the *Engineer*, received the support of the French authorities. The estimated cost is 2,400,000*l*.

WE are sorry to learn from the annual report on the British Museum that there has been a falling off in the number of persons visiting the institution during the year 1906. The total number of visits paid to the museum at Bloomsbury was 691,950, showing a decrease of nearly 122,000 from the number in 1905. The Sunday total of 55,738 was less by 4369 than that of the previous year. Not since the year 1900, with its 689,249 visits, has the total been so low as that of the past year. The report upon the Natural History Museum also shows a decline in the number of visitors. In 1905, 566,313 visits were paid, and in 1906 only 472,557. The attendance on Sundays was, in 1906, 61,151, and in 1905 70,084. The gifts to the Natural History Museum in 1906 numbered 2057, against 2092 in 1905; the principal donors were the Government of India (collections of Tibetan insects), the Duke of Bedford (zoological specimens from Japan and Korea), Mr. C. D. Rudd (specimens in continuation of his systematic survey of South African fauna), and Mr. W. E. Balston (natural history specimens from Western Australia).

PROF. F. A. FOREL has favoured us with a note of a very unusual shifting of the wind observed by him during a storm at Morges (north of Lake of Geneva) on August 15. At 6h. p.m. the wind, which was blowing strongly from S.W., veered during a succession of violent squalls to N.W., N.E., and S.E., back again to S.W. by 10h. p.m., making a complete gyration in four hours. The weather in north-west Europe was very unsettled; a cyclonic disturbance which had passed across England lay over the Skager Rack at 6h. p.m., and a heavy thunderstorm was in progress at Berlin. Prof. Forel thinks that the sudden changes of wind could only have been caused by thunderstorms which occurred in various quarters in the vicinity of Morges. The barometer, which previously had been slowly falling, rose 0·2 inch between 6h. and 10h. p.m.

IN an editorial article in *Symons's Meteorological Magazine* for August, objection is taken to the way in which meteorological papers are dealt with at the British Association meetings. Several papers this year were of special interest, *e.g.* examples of modern methods of treating observations, by W. P. Elderton, and recent developments of the methods of forecasting by means of synoptic charts, by Dr. W. N. Shaw, but they were sandwiched with papers on astronomy and other subjects with which meteorologists were not particularly concerned. The difficulties in the way of hearing and discussing the papers were aggravated this year owing to the bewildering acoustic properties of the hall, and Dr. Shaw's paper was cut cruelly short owing to want of compression in the case of a previous astronomical paper. The writer of the article considers that unless at least a subsection is devoted to the subject in future, it will not be worth while for meteorologists to contribute papers to the British Association.

IN the same magazine Colonel Bentley refers to a very severe thunderstorm which occurred in County Clare on July 22. On the east of the Kilbane Mountains, near Killaloe, gaps of 10 feet and one of 30 feet deep were made in the road, and five large stone bridges and one wooden bridge were carried away by the floods in a district three miles long and one mile wide. During the storm hail fell in large rugged lumps, and the damage to property is estimated at 6000*l*.

FROM the annual report of the principal chemist on the work of the Government Laboratory, we learn that during the past year there has been a notable increase in the number of samples analysed in the two branches of the laboratory (Customs and Inland Revenue). The total number of analyses and examinations made was 173,606, against 158,939 for the previous year, the increase being mainly in respect of tobacco examined under the various fiscal regulations. Among other points of interest, we note that manufacturers appear fully to appreciate the advantages of the new or "industrial" variety of methylated spirit, which, by reason of its lower price and greater purity compared with that formerly used, is expected to find increasing employment in manufacturing operations. The use of pure duty-free ethyl and methyl alcohols in the science laboratories of universities and colleges is also extending, 4017 proof gallons having been utilised last year against 2277 in 1905. In addition, 3783 bulk gallons of the denatured (industrial) alcohol were used for ordinary teaching purposes. For departments other than the revenue branches some 7000 samples were analysed. To check the importation of adulterated butter, legal proceedings were instituted in a number of cases, and it is satisfactory to learn that, as a result, there has been a great improvement in the character of the butter emanating from certain parts of the Continent. An interesting examination of dog-fish eggs was made for the Board of Agriculture and Fisheries in connection with the depredations committed by these fish along the coasts of Devonshire and Cornwall. With the view of ascertaining their economic possibilities, the eggs were analysed, and found to contain about one-fourth of their weight of protein and the same quantity of fat, or about twice as much of the two substances together as is found in an ordinary hen's egg. It is remarked that, apart from the question of using the eggs for food—as to which there is an obstacle in their fishy odour—the utilisation of the protein matter and oil would be quite feasible if some enterprise were shown in obtaining a regular and sufficient supply of the eggs.

Referring to a note published in Nature (this vol., p. 280) on the recent series of determinations of fundamental atomic weights by Prof. Richards and his colleagues, Prof. Bohuslav Brauner, of Prague, writes to say that he considers that there can be no doubt as to the correctness of the recently advocated low value of the atomic weight of nitrogen (14·01); the physico-chemical researches of Leduc, D. Berthelot, Lord Rayleigh, Guye, and Gray, as well as those of Scott in 1901, all tend to show that the atomic weight of nitrogen does not exceed 14·009. Prof. Brauner refers to a paper which he read before the Bunsen Gesellschaft in May (reprinted in the *Chemiker Zeitung*, No. 38) for a full discussion of the question, and to his article on the atomic weight of nitrogen in Abegg's "Handbuch der anorganischen Chemie." The new value for the atomic weight of nitrogen has the advantage that it is directly related to the atomic weight standard $O=16$, whereas that of silver is related very indirectly and only by imperfectly determined ratios to the oxygen standard. The recent work of Guye would indicate that potassium chlorate always contains potassium chloride, the quantity of the latter being sufficient to reduce the atomic weight of silver from 107·93, as found by Stas, to 107·89. Prof. Brauner considers that the results of Prof. T. W. Richards should be stated as follows:—"The atomic weight of nitrogen cannot be higher than 14·10 and lower than 14·08, and so the atomic weight of silver must lie between $Ag=107·880$ and 107·883. The atomic weight of sulphur cannot be higher than $S=32·069$, and therefore the atomic weight of silver cannot be higher than $Ag=107·88$."

A report by Dr. Leslie Mackenzie on the teaching of school and personal hygiene to students in training as teachers in Scotland has been issued by the Scotch Education Department. The object of the course of instruction which has been instituted is to assist the teacher in discovering such gross mental or physical defects as may unfit, or tend to unfit, the child for school work. The methods of instruction include lectures and demonstrations on elementary anatomy, physiology, and hygiene, and visitation of schools with inspection of classes and premises. Among other matters, the place of the subject in the curriculum, the relation of the course to medical inspection, and tests of proficiency are discussed, and selected illustrations of the work done in various training colleges are given. The Department has also issued a memorandum on systems of physical training, viz. military drill and physiological and hygienic exercises, and their relation to the personal hygiene of school life. The special education of the teacher for this is insisted upon, and it is recommended that a medical officer ought to be in charge of this branch at every training centre.

The annual report of the British Consul at Dakar gives particulars of the steps which are being taken by the French Government in French West Africa to safeguard and develop the rubber resources of the country. A special survey is being made of the chief rubber-producing districts, and when the investigations have been completed the worst districts will be closed to rubber collection so that the plants may have time to recuperate. It is expected that a beginning in this direction will be made in 1908. For the purpose of stocking plantations with rubber-producing trees, a credit of 3200*l.* has been provided for the present year, with which sum it is expected that from 300,000 to 400,000 trees will be planted, in addition to nursery plantations for succeeding years. The intention is to set apart from 4800*l.* to 6000*l.* each year for this purpose, and to plant on an average 500,000 trees every year.

According to the *Agricultural News* of Barbados, a plant has been discovered in Portuguese West Africa possessing a fleshy, tuberous, turnip-shaped root, the entire substance of which is permeated with laticiferous ducts, that yield a supply of rubber latex. The plant belongs to the natural order Asclepiadaceæ. Rubber has been obtained from the tubers by slicing them, applying pressure, and coagulating with alcohol. Tubers two years old weighed nearly 1½ lb., and yielded rubber of half of 1 per cent. of the total weight. It is estimated that more than 180 lb. of rubber per acre can be produced at the end of two years.

Among the various subjects dealt with in the Journal of the Royal Horticultural Society, vol. xxxii., an article by Mr. M. H. F. Sutton furnishes practical directions on the formation and care of lawns and golf greens. The author attributes great value to manuring the soil when laying out a lawn. In connection with the choice of seeds, a list of grass seeds is given, also the use of clover is discussed and its disadvantage for tennis lawns or putting greens is explained. Growers of campanulas will find a useful list of species and synonyms prepared by Colonel R. H. Beddome. A method of checking black-currant gall mites by the application of grease is described by Mr. Massee. The substance of a lecture by Sir George Watt on the cultivation and manufacture of tea is published, also an account of the West Indian lime by Mr. A. J. Brooks, and a description by Mr. J. C. Umney of the source and extraction of perfumes.

With regard to the flowering of bamboos, it has been noted that this takes place only after a period of years, that some species show sporadic or partial flowering, while the flowering of others is simultaneous or complete, and is always or nearly always followed by the death of the plant. Mr. W. J. Bean has collated in the *Kew Bulletin* (No. 6) some data regarding species that have flowered under cultivation within the last thirty years.

*Arundinaria Falconeri* flowered sporadically in localities in England and India in 1876, and partial flowering occurred in other localities in 1875 and 1877. Another partial flowering has been proceeding for the last three years; the author suggests that the present more protracted period may be due to cultivation. *Arundinaria Simoni*, after partial flowering for some years, flowered completely in 1904–5, and then the plants died off. Most of the varieties of *Phyllostachys nigra* have also succumbed to the efforts attending complete flowering.

To the popular series of garden pamphlets issued by the Agricultural and Horticultural Association has been added one by Mr. S. Arnott on hardy garden bulbs and how to grow them. The precise notes on planting details will be found useful, as also the selection of hardy and choice species. Another pamphlet, on the weather, by Hon. H. A. Stanhope, the president of the association, is not of such direct interest, but contains a number of facts that the weather-wise—and with good reason many gardeners have such a reputation—should know.

TEACHERS of geology and travellers in India will alike welcome Mr. Vredenburg's pamphlet of seventy pages, entitled "A Summary of the Geology of India" (Calcutta: Thacker, Spink and Co., 1907). It is a summary that is full of information, and yet it is both readable and attractive. The most recent work of the Geological Survey of India is included, as may be seen from the account of the Cretaceous Deccan Trap and the references to Burma and Baluchistan. The recession of the sea at the close of Cretaceous times is regarded as a "universal" phenomenon, while the "Glacial period" is spoken of lightly, as resulting in a "temporary glaciation of high latitudes." In both these statements we note a little more dogma than is prudent in an abstract, where discussion is impossible. Mr. Vredenburg is, however, no mere abstractor of the work of others, but an observer and a discoverer, whose personality adds weight to the present lucid summary.

A NEW gem is reported to have been discovered in San Benito County, California. It is described as a clear, transparent, blue stone with violet tints in the deeper-coloured portion, and to be about as hard as chrysolite and harder than moonstone or opal. Under heat it turns a bright red, but on cooling it resumes its normal colour. It has been given the name of Benito, from the county in which it was found.

A LARGE and remarkable cave was, according to the *Scientific American*, recently discovered in the Santa Susanna Mountains, some fifty miles from Los Angeles, California, U.S.A. The cave contains many halls, some of very large extent, and the walls of one are covered with rude drawings, some of which are almost obliterated, but others are quite clear. The drawings, says our contemporary, represent incidents of the chase, showing Indians on foot pursuing bear, deer, and other animals. One wall-drawing shows the bear pursuing the hunter. The work is executed by soft red stone.

THE connection between radium and the safe working of collieries does not at first sight appear to be a very intimate one, but the discovery announced by Profs. Elster and Geitel in *Die Welt der Technik*, that fire-damp contains six or seven times the amount of radium emanation that is generally found in the air of coal mines, brings the two into close relation with each other. Comparative tests of the electrical conductivity of the air due to the presence of the emanation can readily be made by means of a simple aluminium foil electroscope, and as only a comparatively small sample of the gas is necessary, the tests may be carried out outside the mine. It will be interesting to see the electroscope become part of the normal equipment of a colliery.

IN the July number of the *Bulletin de la Société d'Encouragement pour l'Industrie nationale*, M. O. de Faria gives a description and an account of the tests of his alternating electric current rectifier. The electrodes are of aluminium and an alloy of lead and antimony respectively, and the electrolyte a solution of phosphate of soda. The cell is so arranged that during working a rapid circulation of the electrolyte is maintained. In one of the tests of which details are given a rectifier intended for 10 amperes was run for five hours at 15 amperes on a 100-volt circuit, and showed an efficiency of 66 per cent. with a final temperature of 47° C. The efficiency appears to be independent of the temperature of the cell.

THE origin and relationships of the so-called Atlantic animals and plants of western Norway are discussed at considerable length by Dr. L. Stejneger in vol. xlviii., part iv., of Smithsonian Miscellaneous Collections. The mammals include the west Norwegian red deer (which the author regards as inseparable from the Scottish representative of the species, although markedly distinct from the Swedish race), the so-called Celtic horse or pony, the reindeer, lemming, and Arctic fox. It is concluded that if the more characteristic types of this "Atlantic biota" came from Scotland, they travelled by way of a land-bridge connecting that country with western Norway to the northward of lat. 59°. This bridge existed subsequent to the first great (Scandinavian) glaciation, and this portion of the "biota" certainly survived the second glaciation. The red deer and Arctic animals reached Scotland from Central Europe, whence they migrated first into Ireland and then into Scotland. Reindeer, on the other hand, appear to have reached Scandinavia by several routes, one stock having probably entered Sweden from the south and a second from the north-east *via* Finland and Russia, while the Norwegian stock arrived from the west. If well founded, these conclusions absolutely cut away the ground from Dr. Scharff's theory that reindeer reached Europe from Greenland, a theory controverted by several other considerations.

IN a paper on the birds of Labrador, forming No. 7 of vol. xxxiii. of the Proceedings of the Boston Society of Natural History, Messrs. C. W. Townsend and G. M. Allen take occasion to refer to the appalling destruction of birds and their eggs which is still allowed to go on in Newfoundland, Labrador. The fishermen, who use single-barrel, muzzle-loading guns, make no secret of the fact that they take every bird and egg upon which they can lay hands. If efficient means of protection are not promptly put in force, the authors are of opinion that the bird-nurseries of the district will become things of the past.

HAVING observed sand-martins in Hampshire during the winter—November to January—Mr. H. Beeston, in the July number of the *Zoologist*, confesses himself unable to explain where these birds passed the nights during the period in question. As there appear to be no sand-banks in the district where the observations were made, it seems impossible for the birds to follow their usual practice of sleeping in their nesting-burrows.

IN the *Entomologist's Monthly Magazine* for August, the attention of collectors is directed to the possibility that the south European wingless earwig (*Forficula decipiens*) may be indigenous to England, since two earwigs with aborted wings recently taken in the Isle of Wight appear indistinguishable from that species.

AN elaborate cloth-bound illustrated catalogue (in English) of the physical apparatus made by the firm of E. Leybold's Nachfolger, of Cologne, has been sent to us. It contains full descriptions of many pieces of apparatus, with instructions for use, and should be seen by all science teachers.

## OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN SEPTEMBER :—

Sept. 3. 8h. Mercury and Venus in conjunction. Mercury 0° 26′ N.
4. Daniel's comet in perihelion.
12. 11h. 15m. Minimum of Algol (β Persei).
14. 12h. Venus in superior conjunction with Sun.
15. 8h. 4m. Minimum of Algol (β Persei).
,, 14h. 1m. Transit (egress) of Jupiter's Sat. III. (Ganymede).
16. 11h. 13m. Mars in conjunction with Moon. (Mars 4° 27′ S.).
17. 14h. Saturn in opposition to the Sun.
21. 7h. 10m. to 7h. 59m. Moon occults 30 Piscium (mag. 4·7).
,, 9h. 4m. to 9h. 37m. Moon occults 33 Piscium (mag. 4·6).
22. 14h. 42m. to 18h. 20m. Transit of Jupiter's Sat. III. (Ganymede).
23. 18h. Sun enters Libra. Autumn commences.
24. 12h. 51m. to 13h. 46m. Moon occults μ Ceti (mag. 4·4).
,, 18h. 1m. Transit (ingress) of Jupiter's Sat. IV. (Callisto).
26. 11h. 57m. to 12h. 59m. Moon occults $\delta^2$ Tauri (mag. 4·7).
29. 18h. 58m. Transit (ingress) of Jupiter's Sat. III. (Ganymede).

W E Rolston

DANIEL'S COMET (1907*d*).—The following is an extract from the continuation of Dr. Stromgren's ephemeris for comet 1907*d* as published in No. 4196 of the *Astronomische Nachrichten* (p. 337, August 23).—

*Ephemeris 12h. (M.T. Berlin).*

| 1907 | α (true)<br>h. m. | δ (true)<br>° ′ | log *r* | log Δ | Brightness. |
|---|---|---|---|---|---|
| Sept. 1 | 8 50·8 | +13 34·6 | 9·7144 | 0·0534 | 19·1 |
| ,, 3 | 9 4·0 | +12 59·3 | | | |
| ,, 5 | 9 16·8 | +12 22·6 | 9·7123 | 0·0847 | 16·7 |
| ,, 7 | 9 29·4 | +11 44·6 | | | |
| ,, 9 | 9 41·5 | +11 5·7 | 9·7250 | 0·1139 | 13·7 |

An observation at Padua on August 18 gave corrections of +30s. and −0′·7 to this ephemeris.

On September 1 the comet will be 81′·5 N. of α Cancri, whilst on September 8 it will be 66′·4 N. of *o* Leonis.

The comet will rise about 2¼ hours before the sun on September 1, and about two hours before the sun on September 9.

FURTHER OBSERVATIONS OF MARS.—The August number of the *Bulletin de la Société astronomique de France* contains an interesting paper by M. Jarry-Desloges giving the results of observations of Mars made during July last at a temporary observatory erected on the summit of the Revard at an altitude of 1550 metres.

M. Jarry-Desloges and his collaborator, M. G. Fournier, confirmed the doubling of the Solis Lacus announced by Mr. Lowell. They also comment upon the cloudy appearance of the Martian landscape in the northern hemisphere as compared with the clear-cut features of the southern hemisphere of the planet.

The faint canals were difficult to observe, but the Ganges was seen to be very broad and appeared double, the two points where it emerges from the Auroræ Sinus being seen quite sharply; the observer states, however, that this observation needs confirming.

On July 19 the region north of Lacus Niliacus was clear, but twenty hours later, on July 20, details of white spots could be seen; thus it appears that in less than twenty hours the clouds or mists which covered this part of the planet vanished.

Rolston

A SUSPECTED, LARGE PROPER MOTION.—Having occasion to measure the places of three B.D. stars (B.D. +1°·2720, +1°·2722, and +0°·2957) on his star photographs, Prof. Barnard found that the positions determined by him for two of the stars differed considerably from the B.D. positions. That of 1°·2720 is unusually discordant with the B.D., though the difference may be due to an error in the latter; but in the case of 0°·2957 the difference between Prof. Barnard's position and that determined at Bonn amounts to nearly a second of time. Therefore, if the observations are correct, the star B.D. +0°·2957 must have a considerable proper motion (*Astronomische Nachrichten*, No. 4195, p. 313, August 7).

do

THE ASTROGRAPHIC CHART.—From No. 386 of the *Observatory* (p. 329, August) we learn that the Potsdam Observatory does not intend to take and distribute the long-exposure photographs (chart plates) of the zone (+32° to +39°) allotted to it. The work will be done at the Royal Observatory of Belgium, which is being reorganised on a somewhat liberal scale.

do

THE SIMULTANEOUS INVISIBILITY OF JUPITER'S SATELLITES.—On March 7 we referred in these columns to the simultaneous invisibility of Jupiter's four major satellites on October 3 next. In the August number of the *Bulletin de la Société astronomique de France* (p. 356) M. Flammarion gives fuller details of the phenomenon, and shows, by means of a diagram, the disposition of the four satellites, in regard to Jupiter, between the hours of 19h. 56m. and 20h. 6m. on the date named. As Jupiter does not rise until after midnight, European observers will not be able to watch this unusual spectacle; it will, however, be visible in Asia and Oceania.

The first observation of this phenomenon was made by Galileo on March 15, 1611, and only on eight occasions since then has it been observed.

do

LATITUDE-VARIATION AND LONGITUDE DETERMINATIONS.—Part i., vol. ix., of the *Annalen der Sternwarte in Leiden* contains accounts of a series of latitude-variation observations made by Father J. W. J. A. Stein during the period June, 1899, to July, 1900, and of a determination of the difference of longitude between Leyden and Ubagsberg made by the director of Leyden Observatory, Dr. H. G. van de Sande Bakhuyzen, and M. J. H. Wilterdink.

Father Stein employed the Horrebow method, making 1590 observations on 117 nights. He discusses the observations, the instrument, and the reductions at some length.

Ubagsberg is a geodetic station situated in the province of Limbourg, between Maastricht and Aix-la-Chapelle, and is an important point from the fact of its having been made a station in three distinct triangulations. The difference of longitude between the geodetic pillar at Ubagsberg and the meridian circle at Leyden was found to be +5m. 52·314s. ±0·015s.

do

THE COLOURS AND SPECTRA OF STARS.—A paper by Mr. W. S. Franks, appearing in No. 8, vol. lxvii., of the Monthly Notices (R.A.S.), discusses the relation between the colours and spectra of star classes.

He tabulates 1360 stars under colours as observed by members of the B.A.A., and spectra as given in the Harvard publications, and finds, in general, a very close connection between the two features. Of 282 helium stars, 125 belong to the white or O colour class, whilst 168 of the 377 hydrogen stars come under the same heading. On the other hand, 210 of the 241 solar stars come under the colours between $Y^2$ and $Y^3$.

Whilst making the investigation Mr. Franks was impressed by the marked affinity of helium and bright-line stars (types B and O) with the galaxy. All the bright-line spectra met with were in or near the Milky Way, and when one remembers that the Wolf-Rayet stars, all the Novæ, and the majority of short-period variables are also galactical, it is obvious that the Milky Way is, in some way yet undetermined, probably the seat of cosmical actions of primary importance.